Patent Claims

1. A sensor for authenticity identification of luminescent signets on documents, in which the signet is illuminated with an excitation wavelength and may respond at a different wavelength, with the response wavelength being detected and evaluated by a radiation receiver, **wherein** a focused beam, which is emitted from a beam source, is converted by focusing optics in such a manner that a scanning line, which is approximately in the form of a bar, is projected on the surface of the document to be investigated, which causes the signet, which is arranged on the document, to fluoresce at least in one subregion, and the fluorescence signal produced in this way is passed via detection optics to an evaluation unit, which evaluates the fluorescence signal.

2. The sensor as claimed in claim 1, **wherein** the document is moved past the measurement window approximately at right angles to the longitudinal axis of the scanning line.

3. An authenticity feature for detection using a sensor as claimed in claim 1 or 2, **wherein**, in order to identify the signet on a document, the signet is equipped, at least in subregions, with a pigment which can be detected using the up-conversion effect.

4. An authenticity feature for detection using a sensor as claimed in claim 1 or 2, **wherein** the signet can be detected as a fluorescent authenticity feature, using the down-conversion effect.

5. An authenticity feature for detection using a sensor as claimed in claim 1 or 2, **wherein** the signet is excited, as a fluorescent authenticity feature, at a specific wavelength, and responds at the same wavelength.

6. The reality feature for detection using a sensor as claimed in claim 5, **wherein** the emission wavelength of the authenticity feature is at the same wavelength as the excitation wave, and wherein the pulse response follows the excitation pulse with a time delay.

7. The authenticity feature for detection using a sensor as claimed in one of claims 1 to 6, **wherein** the pigments are added directly to an applied solution, to an applied paint, to the adhesive or to the paper.

8. The sensor as claimed in one of claims 1 to 7, **wherein** position-resolved detection is carried out in the transport direction.

9. The sensor as claimed in one of claims 1 to 8, **wherein** the sensor is in the form of a two-band sensor, in which the test object is illuminated once and in which two different spectral bands are evaluated.

10. The sensor as claimed in one of claims 1 to 9, **wherein** the sensor is in the form of a UV luminescence sensor, in which the test object is illuminated with UV light (for example using a UV LED at a wavelength of 370 nm), and wherein the luminescence signal is detected in a different spectral band.

11. The sensor as claimed in one of claims 1 to 10, **wherein** an additional object detector (optical barrier) is used, which indicates to the sensor when the object (signet) starts and when it ends.

12. The sensor as claimed in one of claims 1 to 11, **wherein** pigments having a fast rise time and a fast decay time (for example typically 0.1 m/s) are used.

13. The sensor as claimed in one of claims 1 to 12, **wherein** a laser wavelength of 980 ± 10 nm is used for excitation.

14. The sensor as claimed in one of claims 1 to 12, **wherein** a laser wavelength of 850 ± 10 nm is used for excitation.

15. The sensor as claimed in one of claims 1 to 14, **wherein** the laser line produced using cylindrical lenses has an illumination intensity whose maximum occurs at the center of the line.

16. The sensor as claimed in one of claims 1 to 15, **wherein** the laser line is produced using an aspherical cylindrical lens.

17. The sensor as claimed in one of claims 1 to 15, **wherein** the laser line is produced using a sinusoidal lens surface.

18. The sensor as claimed in one of claims 1 to 15, **wherein**, in order to compensate for the sensitivity variation of the receiver, the illumination intensity of the laser line is increased slightly at the edge of the laser line.

19. The sensor as claimed in one of claims 1 to 18, **wherein** a reflection cone (31) is arranged in front of the electronic evaluation unit for beam intensification which is in the form of a funnel-shaped or cylindrical hollow body having a metallically coated surface on the inside, or is in the form of a transparent funnel-shaped or cylindrical solid body.

20. The sensor as claimed in claim 19, **wherein** a photo multiplier having a detection surface roughly in the form of a point and whose surface corresponds approximately to the outlet surface (32) of the reflection cone is arranged immediately behind the reflection cone (31).

21. The sensor as claimed in one of claims 1 to 20, **wherein** only a portion of the scanning line (9) is in each case imaged on the receiver (18) via a respective lens (20,

20'') (Figure 5), with these different imaged parts of the scanning line overlapping one another.

22. The sensor as claimed in claim 21, **wherein** the lenses (20, 20'') are arranged as a stack, resting closely against one another, at the window (8, 8') of the housing (1).

23. The sensor as claimed in claim 21 or 22, **wherein** the light from each lens (20, 20'') is passed through a respective reflection cone (31) and falls on a respective receiver (18).

24. The sensor as claimed in one of claims 1 to 23, wherein the transmitting and receiving beams are joined together via a dichroic beam splitter, and leave the sensor housing together.